

# ECM group

January 16, 2006

Peter Van Alyea  
Redwood Oil Company  
P.O. Box 428

Re: Workplan for Monitoring Well Destruction/Replacement  
and Air Sparge Point Destruction  
4925 Sonoma Highway  
Santa Rosa, CA

Dear Mr. Van Alyea:

ECM has prepared this workplan for destruction of: monitoring well MW-3, and air sparge points AS-4 through AS-7 at the above-referenced site (Figures 1 and 2, attached). The monitoring well and the sparge points are in the footprint of a planned remedial soil overexcavation. The remedial soil overexcavation will be discussed in a separate workplan

MW-3 is a 2-inch diameter well constructed with a PVC casing, installed to a depth of 40 ft below ground surface (bgs). The sparge points are constructed of 1-inch diameter PVC casings with 2-inch diameter ceramic injection points, installed to 30 ft bgs. MW-1 and the sparge points will be destroyed in accordance with all applicable state and local regulations by a California licensed well driller. A hollow-stem drill rig will be used to overdrill the well casings. The well casing, ceramic injection point, and all construction materials (grout, bentonite, sand) will be removed. After casing removal, the resulting bore-holes will be grouted to surface.

Subsequent to the remedial soil overexcavation and site remodeling, a replacement well (MW-3A) will be installed at the location of MW-3. MW-3A will be installed by a California licensed well driller, in accordance with ECM Standard Operating Procedures for Monitoring Well Installation (Attached). A figure showing typical Well Construction Details is also attached.

Following the remedial soil overexcavation and site remodeling, the need for additional site remediation will be re-evaluated. If appropriate, a new air sparge system or other remediation system will be designed and installed.

**P.O. Box 802, Benicia, CA, 94510 << 707-751-0655 >> 707-751-0653 (fax)**

Peter Van Alyea  
Workplan for Monitoring Well Destruction/Replacement  
and Sparge Point Destruction

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Thank you for allowing ECM to provide environmental consulting services to Redwood Oil Company. Please call if you have questions or require additional information.

Sincerely,  
ECM Group



Jim Green  
Professional Engineer #C58482

Attachments: Figures  
ECM Standard Operating Procedures for Monitoring Well Installation  
Well Construction Details

cc: Jo Bentz, North Coast Board  
John Anderson, Sonoma County Env. Health Division

## **APPENDIX A**

### **FIGURES**

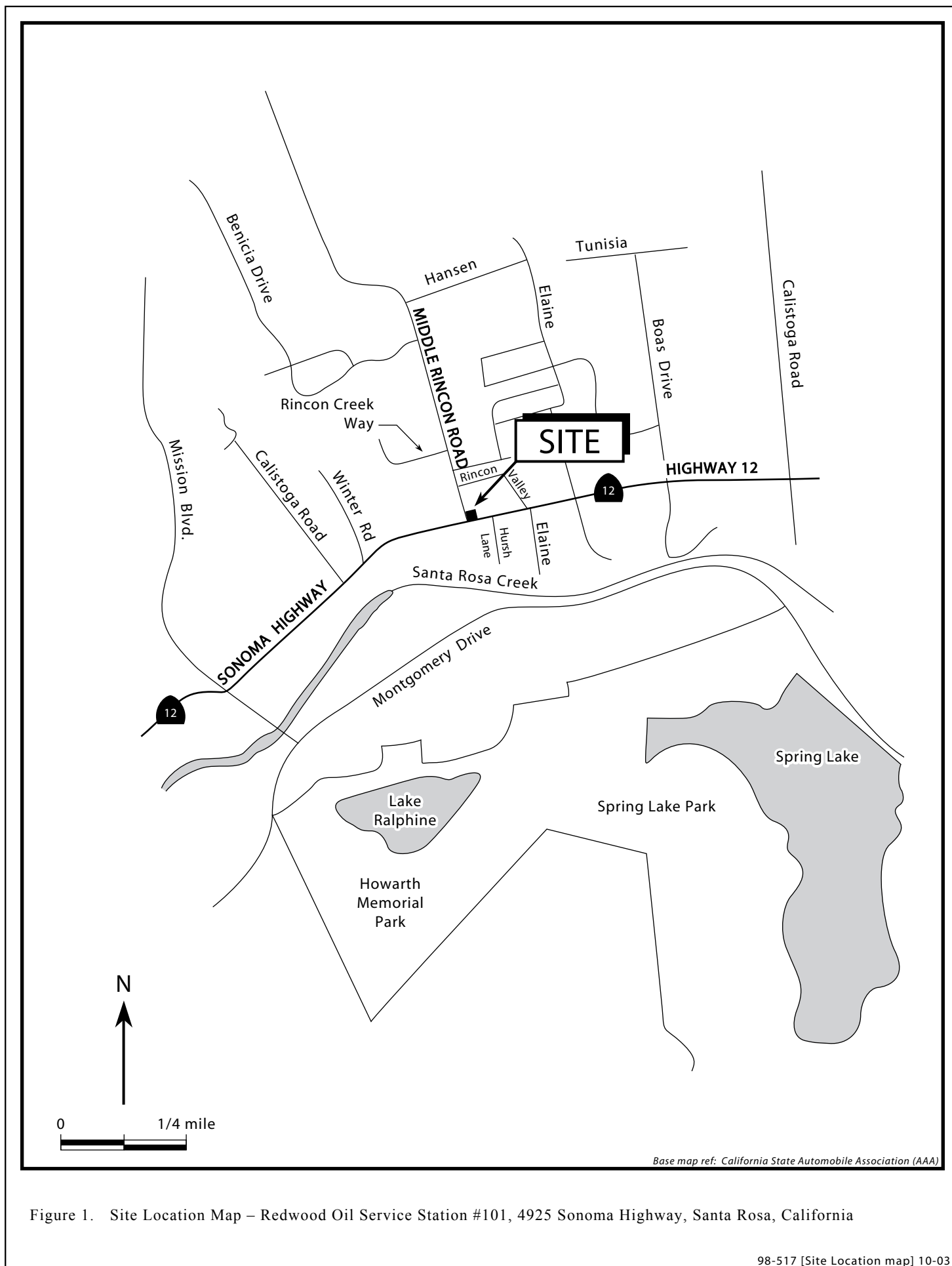
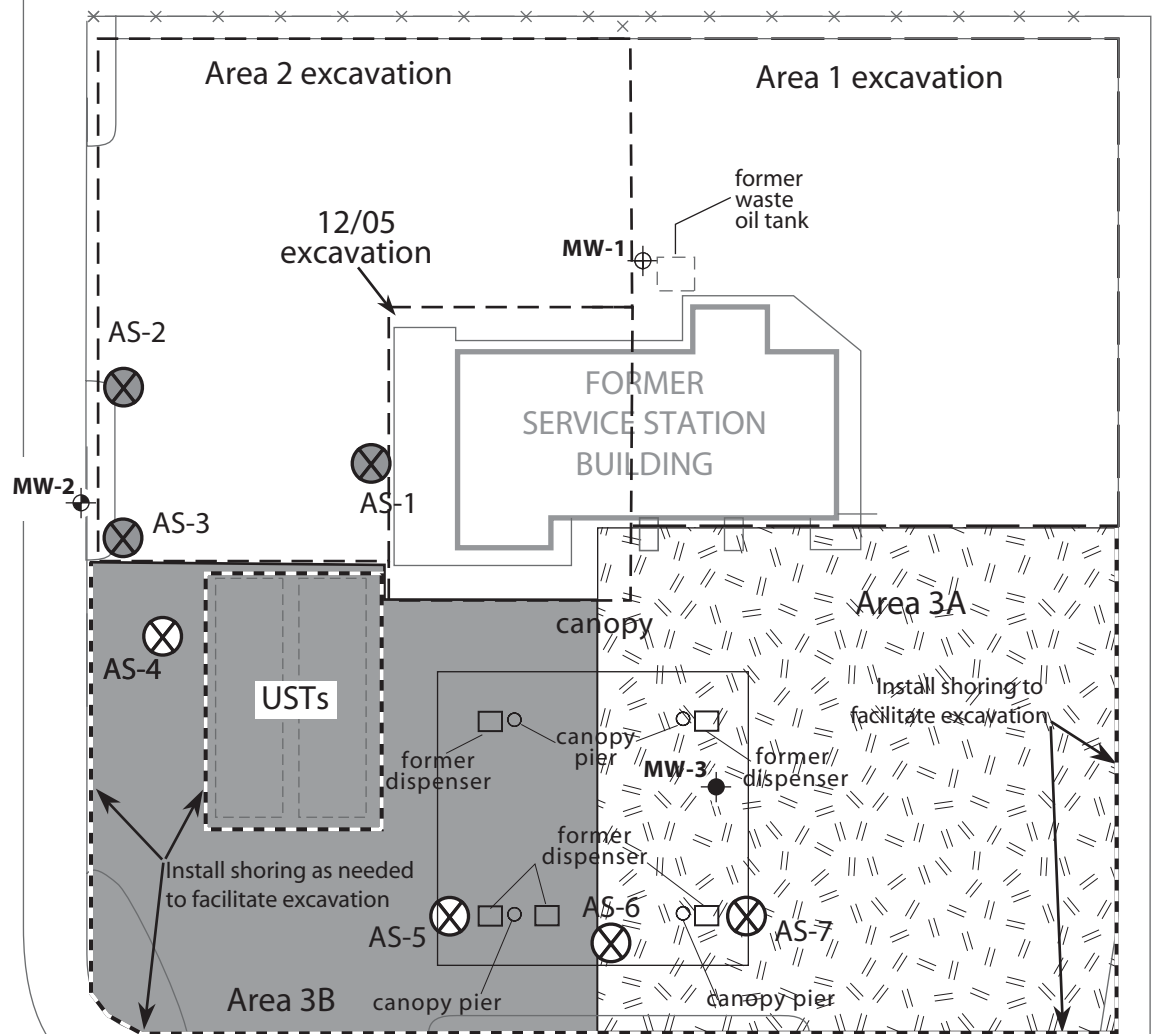
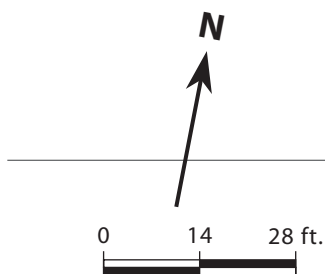


Figure 1. Site Location Map – Redwood Oil Service Station #101, 4925 Sonoma Highway, Santa Rosa, California

MIDDLE RINCON ROAD



SONOMA HIGHWAY / HIGHWAY 12



#### EXPLANATION

|  |      |                                    |
|--|------|------------------------------------|
|  | MW-2 | Monitoring well                    |
|  | MW-1 | Destroyed monitoring well          |
|  | MW-3 | Monitoring well to be destroyed    |
|  | AS-4 | Air injection well to be destroyed |
|  | AS-3 | Destroyed air injection well       |
|  |      | Shoring                            |

Figure 2. Site Plan and Excavation Limits - Redwood Oil Service Station #101, 4925 Sonoma Highway, Santa Rosa, California

**APPENDIX B**  
**ECM STANDARD OPERATING PROCEDURE**

## **ECM STANDARD OPERATING PROCEDURE**

### **MONITORING WELL DESIGN AND CONSTRUCTION**

Where possible, information from published and unpublished reports is reviewed prior to installation of monitoring wells. Relevant data includes highest and lowest anticipated ground water elevations, aquifer materials, aquifer yield and contaminants expected. This information is used to aid the field geologist rather than to predetermine how the wells will be constructed. Well construction is based on *site specific conditions* and is determined in the field after discussion with the senior geologist.

Monitoring wells are constructed with flush-threaded, 2-inch or 4-inch diameter, slotted PVC, stainless steel or teflon well screen and PVC, stainless steel or teflon blank casing. Number 3 or #212 sand is used in the annular space around the well screen. The sand is placed into the annular space around the well screen to approximately 2 feet above the top of the well screen. If high ground water conditions exist, the sand may be placed 0 to 1 foot above the top of the well screen. Two feet of bentonite pellets are used to separate the sand from the sanitary surface seal (grout). If high ground water conditions exist 1/2 foot of bentonite may be used to separate the sand from the sanitary surface seal.

The grout (Portland cement with approximately 3-5% bentonite powder) is poured into the annular space above the bentonite pellets. If the surface seal is greater than 5 feet thick, grout consisting of cement mixed with 3-5% bentonite powder will be tremied or pumped into the annular space above the bentonite pellets to prevent the infiltration of surface water into the well. If the surface seal is less than 5 feet thick, the grout will be poured from the surface. The resulting seal will be checked for shrinkage within 24 hours and additional grout will be added, if necessary. The surface seal is used to prevent infiltration of surface water into the well.

The monitoring well(s) is locked with a stovepipe or cap and covered with a traffic-rated vault if it is located in a developed area. The well ID is clearly marked on the cap or casing.